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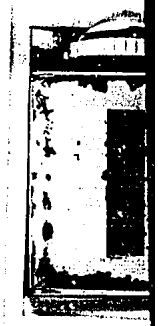

THE WIRED TELEVISION CENTER IN KALININ

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A wired television center which regularly relays the transmissions of the Moscow Television Center is operating in Kalinin. This center was developed and built by the laboratory of the MGRS (Moscow Municipal Wired Radio Network) of the Ministry of Communications USSR.

The radio amateurs of Kalinin have long attempted to receive the Moscow Television Center. However, experiments in this direction both in the Kalinin Radio Club and at home by individual amateurs have not yielded satisfactory results; reception was irregular and unreliable.

Experiments made in Kalinin by workers of the MGRS laboratory revealed that regular high-quality television reception at Kalinin was impossible. In addition to the fact that Kalinin lies in a basin and is some 160 km removed from Moscow, the terrain between Moscow and Kalinin is very unfavorable for the propagation of ultrashort waves. The main obstacles to transmission of the signal are the Kalinin mountain chain, the Negotinskaya mountain chain, the Il'insk plateau, and the region of Solnechnogorsk.

Because of this, it was decided that television programs should be transmitted from Moscow to Kalinin by means of a wide-band interurban cable line. The Kalinin television center receives television signals (with a spread of one v and a frequency band of 50 cps to 3 Mc) and the aural signals (at low frequency and a 5-v level) from a panel which is installed in the equipment room of the Kalinin DRTS (Administration of the Wired Radio Network). These signals come in on a two-conductor balanced rf cable about one km long (See appended figure). This cable is laid in the city telephone conduit.

The station equipment of the Kalinin Wired Television Center consists of two identical amplifier units (operational and reserve) and a control and switching rack placed in a common panel. Each of the amplifier units is designed to supply 60 subscribers. Its video channel contains two stages of preliminary amplification using 6Zh4 and 6P9 tubes and three output stages using G-807 tubes in a cathode follower circuit. A separate distribution line is connected to the output of each output stage. In addition, each unit has a push-pull stage using 6N8S tubes which amplify the sound accompaniment signals.

Each of the amplifier units is supplied from two rectifiers constructed from power transformers from the KVN-49 television receiver with 5Ts3S rectifier tubes. One of the rectifiers produces the voltages for the preliminary video amplification stages and the aural amplifier, and the other supplies voltages to the output stages of the video channel.

The wired television center has provision for remote control and emergency automatic control. The equipment of the center can be switched on and off and the spare set of amplifiers can be connected in from the control board of the equipment room in the DRTS.

The operational amplifier unit is controlled by means of the same balanced pair used to feed the sound accompaniment into the wired radio center. Automatic control of the spare unit and reverse sound control is accomplished through an interoffice trunk line of the city telephone network. The operation of the emergency automatic control depends upon a relay which is connected into the plate circuits of the tubes in the amplifier unit, and also upon a relay in the control board installed at the equipment room DRTS. In addition

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to its instruments for remote control of the wired center, the control board also has elements of visual and audible signaling which indicate the condition of the amplifier units. A television monitor point can be added to the equipment of the center to check the picture and sound both at the center input and at any of the distribution lines. Key switches are provided at the wired center to make possible local connection, disconnection, and switching of the amplifier units.

The distribution network for the video signals of the Kalinin Wired Television Center is constructed from type RK-1 cable in the form of three trunk lines with subscriber taps. A separate line was laid into the Kalinin Oblast Drama Theatre.

The subscriber taps are connected in the trunk lines in special branch boxes using active dividers. The spread in the video signal voltage in the trunk lines is 15 v and 1-1.5 v at the input of the subscriber unit. The subscriber taps use type RK-50 cable.

The sound accompaniment is supplied to the subscribers along three trunk lines constructed of type TRVK 2 x 0.5 cable. The voltage level in these lines is 10 v. The level is reduced to 1.5 v by the dividers in the branch boxes.

The subscriber unit, which is produced in the shops of the MGRS, contains the scanning circuit, the sync circuits, the video signal amplifier, and the sound amplifier. Commercial television receivers can also be used as subscriber units. A number of the tubes in these sets can be removed if they are to operate from the wired television center. For example, the Leningrad T-2 can operate without 11 tubes; the KVN-49, without 7; and the Leningrad T-1 without 9. Several minor reconnections must be made in order to operate these receivers from the wired center but the original circuit can be quickly restored if necessary. By resoldering these connections, one changes the input circuit, the method of modulation of the kinescope beam, and the polarity of the signal applied to the video amplifier.

All the equipment of the Kalinin Wired Television Center is supplied from a power network which is not connected with the Moscow Power System. However, operation has shown that this does not affect the quality of the picture.

At present, however, the quality of the picture at the subscriber points of the Kalinin center cannot be adjudged satisfactory. Since the interurban television channel will not pass a band wider than 3 Mc, the picture definition corresponds to about 250 lines. Therefore, the construction of the existing Kalinin Wired Television Center can be considered only an interesting experiment in the transmission of television be cable over considerable distances.

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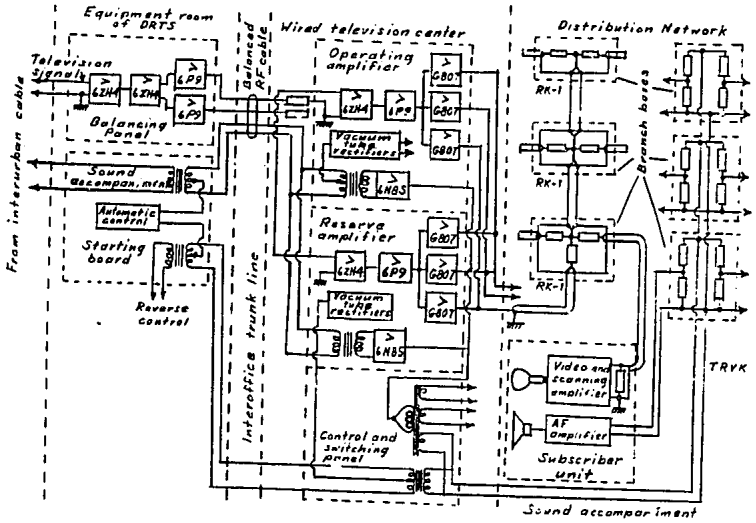

Block Diagram of the Kalinin Wired Television Center

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